What is claimed is:

1. A method of determining the concavity and convexity on a sample, comprising the steps of scanning a portion of a sample including a convex pattern formed thereon with a charged particle beam, and forming a profile waveform based on a charged particle emitted from a location of said sample that has been scanned, said profile waveform comprising a peak, wherein, when one foot portion of said peak converges more gradually than the other foot portion thereof, a portion of said sample corresponding to said one foot portion is determined to be a convex portion.

2. A method of determining the concavity and convexity on a sample, comprising the steps of scanning a portion of a sample including a concave pattern formed thereon with a charged particle beam, and forming a profile waveform based on a charged particle emitted from a location of said sample that has been scanned, said profile waveform comprising a peak, wherein, when one foot portion of said peak converges more steeply than the other foot portion thereof, a portion of said sample corresponding to said one foot portion is determined to be a concave portion.

3. The method of determining the concavity and convexity on a sample according to claim 1 or 2, wherein the charged particle beam is incident on the plane of a substrate perpendicularly.

4. The method of determining the concavity and convexity on a sample according to claim 3, wherein said profile waveform is created based on a charged particle emitted from a location of said sample that has been scanned as the charged particle beam that is perpendicularly incident on the sample is scanned by a scanning deflector.

5. The pattern position detection method according to claim 1 or 2, wherein the position of a pattern on said sample is identified based on the information about the concave and/or convex portions that have been determined.

6. The pattern position detection method according to claim 1 or 2, wherein a convex-concave pattern formed on a substrate is scanned by a charged particle beam, a profile waveform is created based on a reflected or secondary charged particle emitted from a scanned location, and a specific position of said pattern on said substrate is detected based on pattern convex-concave information obtained by said method of determining the concavity and convexity on a sample.

7. The pattern position detection method according to claim 6, wherein a comparison is made with concavity-convexity information about a pre-registered model, in order to detect a specific position on said pattern on said sample.

8. The pattern position detection method according to claim 6, wherein a comparison is made with the profile shape of a pre-registered model, and an error is detected if an evaluation value indicating the difference in their profile shapes exceeds a predetermined value.

9. The pattern position detection method according to claim 6, wherein a comparison is made with the number of edges in a pre-registered model, and an error is detected if the numbers of edges exceed a predetermined value.

10. A method of determining the concavity and convexity on a sample, comprising the steps of scanning a portion of a sample comprising a convex and/or concave pattern formed thereon with a charged particle beam, forming a profile waveform based on a charged particle emitted from a scanned location, and forming a differentiated waveform of said profile waveform, said differentiated waveform

having at least two peaks, wherein a portion of said sample corresponding to a longer interval between the position of one of the peaks and a point where the differentiated waveform becomes zero or converges is determined to be a convex portion, and a portion of said sample corresponding to a shorter interval is determined to be a concave portion.

11. A charged particle beam apparatus comprising a charged particle source, a scanning deflector for scanning a charged particle beam emitted by said charged particle source, and a detector for detecting a charged particle emitted by a sample irradiated by said charged particle beam, wherein the improvement comprises:

a control processor for forming a profile waveform comprising a peak based on the detected charged particle, wherein, when one foot portion of said peak converges more gradually than the other foot portion thereof, a portion of said sample corresponding to said one foot portion is determined by said control processor to be a convex portion.